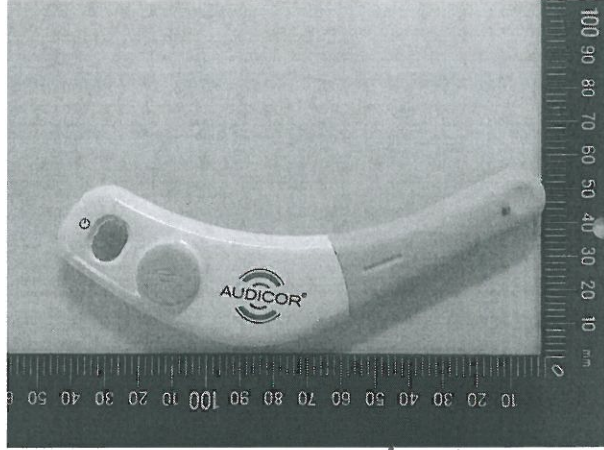
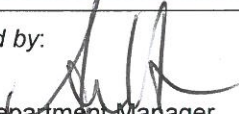


Prüfbericht-Nr.: 10053951 001 <i>Test Report No.:</i>	Auftrags-Nr.: 114039821 <i>Order No.:</i>	Seite 1 von 28 Page 1 of 28
Kunden-Referenz-Nr.: N/A <i>Client Reference No.:</i>	Auftragsdatum: 25-Aug-2015 <i>Order date:</i>	
Auftraggeber: ApoDx Technology, Inc, Suite ER16, 17F., No. 3, Yuanqu St., TW-11503 Nangang Dist., Taipei City Taiwan, R.O.C. <i>Client:</i>		
Prüfgegenstand: DxPatch <i>Test item:</i>		
Bezeichnung / Typ-Nr.: 8ZP7 <i>Identification / Type No.:</i>		
Auftrags-Inhalt: FCC Part 15C test report <i>Order content:</i>		
Prüfgrundlage: <i>Test specification:</i> FCC 47CFR Part 15: Subpart C Section 15.247		

Wareneingangsdatum: 22-Sep-2015 <i>Date of receipt:</i>	
Prüfmuster-Nr.: A000274061-001 <i>Test sample No.:</i> A000274061-001	
Prüfzeitraum: 25-Sep-2015 - 30-Sep-2015 <i>Testing period:</i>	
Ort der Prüfung: EMC/RF Laboratory Taipei <i>Place of testing:</i>	
Prüflaboratorium: TÜV Rheinland Taiwan Ltd. <i>Testing laboratory:</i>	
Prüfergebnis*: Pass <i>Test result*:</i>	

geprüft von / tested by:  2015-12-14 Ryan W. T. Chen / Project Manager <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">Datum <i>Date</i></td> <td style="width: 33%;">Name / Stellung <i>Name / Position</i></td> <td style="width: 33%;">Unterschrift <i>Signature</i></td> </tr> </table>	Datum <i>Date</i>	Name / Stellung <i>Name / Position</i>	Unterschrift <i>Signature</i>	kontrolliert von / reviewed by:  2015-12-14 Arvin Ho / Department Manager <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">Datum <i>Date</i></td> <td style="width: 33%;">Name / Stellung <i>Name / Position</i></td> <td style="width: 33%;">Unterschrift <i>Signature</i></td> </tr> </table>	Datum <i>Date</i>	Name / Stellung <i>Name / Position</i>	Unterschrift <i>Signature</i>
Datum <i>Date</i>	Name / Stellung <i>Name / Position</i>	Unterschrift <i>Signature</i>					
Datum <i>Date</i>	Name / Stellung <i>Name / Position</i>	Unterschrift <i>Signature</i>					
Sonstiges / Other:							

Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>	Prüfmuster vollständig und unbeschädigt Test item complete and undamaged						
<table style="width: 100%; border: none;"> <tr> <td style="width: 20%;">* Legende:</td> <td style="width: 20%;">1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)</td> <td style="width: 20%;">2 = gut 2 = good P(ass) = passed a.m. test specification(s)</td> <td style="width: 20%;">3 = befriedigend F(ail) = entspricht nicht o.g. Prüfgrundlage(n) 3 = satisfactory F(ail) = failed a.m. test specification(s)</td> <td style="width: 20%;">4 = ausreichend N/A = nicht anwendbar 4 = sufficient N/A = not applicable</td> <td style="width: 20%;">5 = mangelhaft N/T = nicht getestet 5 = poor N/T = not tested</td> </tr> </table>		* Legende:	1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)	2 = gut 2 = good P(ass) = passed a.m. test specification(s)	3 = befriedigend F(ail) = entspricht nicht o.g. Prüfgrundlage(n) 3 = satisfactory F(ail) = failed a.m. test specification(s)	4 = ausreichend N/A = nicht anwendbar 4 = sufficient N/A = not applicable	5 = mangelhaft N/T = nicht getestet 5 = poor N/T = not tested
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Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>							

TEST SUMMARY

5.1.1 ANTENNA REQUIREMENT

RESULT: Passed

5.1.2 PEAK OUTPUT POWER

RESULT: Passed

5.1.3 6dB BANDWIDTH

RESULT: Passed

5.1.4 POWER DENSITY

RESULT: Passed

5.1.5 CONDUCTED SPURIOUS EMISSIONS AND FREQUENCY BAND EDGE MEASURED IN 100kHz BANDWIDTH

RESULT: Passed

5.1.6 SPURIOUS EMISSION

RESULT: Passed

6.1.1 ELECTROMAGNETIC FIELDS

RESULT: Passed

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1. General Remarks

1.1 Complementary Materials

These attachments are integral parts of this test report:

Appendix P: Photo Documentation internal view
(File Name: 10053951APPENDIX P)

Appendix D: Test Result of Radiated Emissions
(File Name: 10053951APPENDIX D)

Test Specifications

The following standards were applied.

Table 1: Applied Standard and Test Levels

Radio
NCC Low-power Radio-frequency Devices Technical Regulations LP0002(2011)(100年6月28日) FCC CFR47 Part 15: Subpart C Section 15.247 RSS-247 Issue 1 May 2015 RSS-Gen, Issue 4, November 2014 ANSI C63.10:2013 KDB558074 D01 DTS Meas Guidance v02

2. Test Sites

2.1 Test Laboratory

TUV Rheinland Taiwan Ltd.
Taichung Branch Office

No.9, Lane 36, Minsheng Rd., Sec. 3, Daya District,
Taichung City 428
Taiwan (R.O.C.)

2.2 Test Facility

TUV Rheinland Taiwan Ltd.
Taipei Office

11F. No.758, Sec. 4, Bade Rd., Songshan Dist.
Taipei City 105
Taiwan (R.O.C.)

FCC RegistrationNo.: 799772
IC Canada Registration No.: 9465A-1
TAF Accredited NCC Test Lab. No.:0759
TAF ISO17025 Certification effective periods: 2013-Jul-1st to 2016-Jun-30th



Testing Laboratory
0759

2.3 List of Test and Measurement Instruments

Table 2: List of Test and Measurement Equipment

Kind of Equipment	Manufacturer	Type	S/N	Last Calibration	Next Calibration
EMI Test Receiver	R&S	ESR7	101062	10-Sep-15	19-Sep-16
Bilog Antenna	TESEQ	CBL6111D	29802	4-Jul-14	3-Jul-16
Spectrum Analyzer	R&S	FSV 40	100921	17-Dec-14	16-Dec-15
Spectrum Analyzer	Agilent	N9010A	MY53470241	1-Apr-15	30-Mar-16
Horn Antenna	ETS-Lindgren	3117	138160	12-Jan-15	11-Jan-17
Horn Antenna (18GHz~40GHz)	COM-POWER	AH840	101031	30-Oct-13	29-Oct-15
Preamplifier (30MHz -1GHz)	HP	8447F	2805A03335	24-Dec-14	24-Dec-15
Preamplifier (18 GHz -40 GHz)	COM-POWER	PAM-840	461257	26-Aug-14	26-Aug-16
Pre-Amplifier (1GHz~18GHz)	EM Electronics	EM30180	60558	4-Nov-14	3-Nov-15
Loop Antenna	Schwarzbeck	FMZB 1513	1513-076	22-Oct-14	21-Oct-15
EMI Test Receiver	R&S	ESCI7	100797	28-Dec-14	27-Dec-15
Spectrum Analyzer	R&S	FSL3	101943	7-Sep-15	7-Sep-16
LISN (1 phase)	R&S	ENV216	101243	1-Jun-15	31-May-16
LISN	R&S	ENV216	101262	16-Jun-15	15-Jun-16

2.4 Traceability

All measurement equipment calibrations are traceable to NML(Taiwan)/NIST(USA) or where calibration is performed outside Taiwan, to equivalent nationally recognized standards organizations.

2.5 Calibration

Equipment requiring calibration is calibrated periodically in a suitably accredited Calibration Lab. Additionally all equipment is verified for proper performance on a regular schedule using in house standards or comparisons.

2.6 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements .

Table 3: Emission Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-7}$
RF power, conducted	± 1.5 dB
RF power density, conducted	± 3 dB
spurious emissions, conducted	± 3 dB
all emissions, radiated	± 6 dB
Temperature	± 1 °C
Humidity	± 5 %
DC and low frequency voltages	± 3 %

3. General Product Information

3.1 Product Function and Intended Use

The EUT is a DxPatch . It contains a Wireless 2.4GHz compatible module enabling the user to communicate data through a Wireless interface.
For details refer to the User Guide, Data Sheet and Circuit Diagram.

3.2 System Details and Ratings

Table 4: Basic Information of EUT

Item	EUT information
Kind of Equipment	DxPatch
Type Designation	8ZP7
Brand Name	ApoDx
FCC ID	2AF6P00249453138ZP7

Table 5: Technical Specification of EUT

Technical Specification	Value
Operating Frequencies	2402MHz
Channel number	1
Operation Voltage	6Vdc
Modulation	GFSK
Antenna gain	0 dBi

3.3 Independent Operation Modes

Basic operation modes are:

- A. Transmitting
 - 1. Low channel
 - 2. Middle channel
 - 3. High channel
- B. Receiving
- C. Standby
- D. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

3.5 Submitted Documents

- Circuit Diagram
- Instruction Manual
- Rating Label
- Technical Description

4. Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

The equipment under test (EUT) was configured to measure its maximum power level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Setup for testing: Test samples are provided with a USB interface which makes it possible to control them through a test software installed on a notebook computer.

This software was running on the laptop computer connected to the EUT. It was used to enable the operation modes listed in section 3.3 as appropriate.

The samples were used as follows:

Conducted: A000274061-001

Radiation: A000274061-001

Full test was applied on all test modes, but only worst case was shown

4.3 Special Accessories and Auxiliary Equipment

The product has been tested together with the following additional accessories:

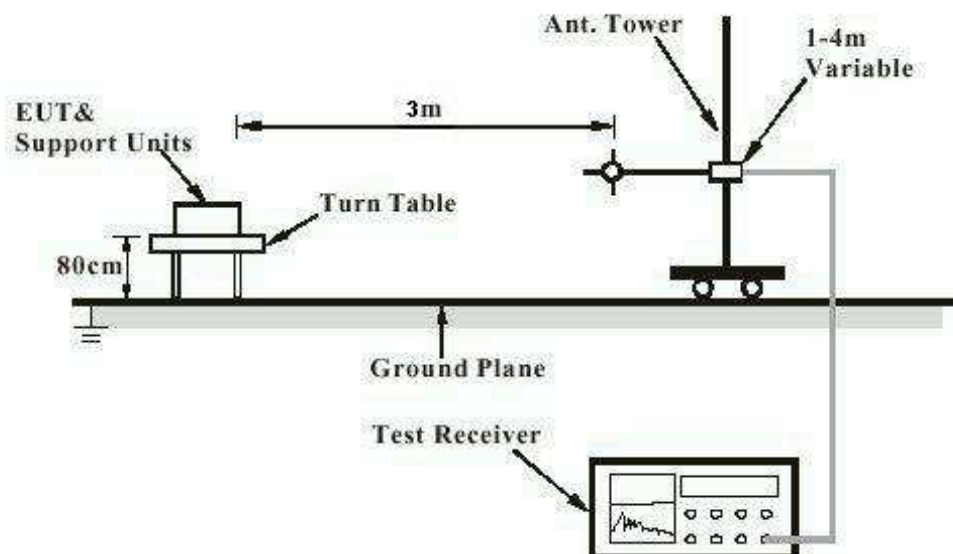
Kind of Equipment	Manufacturer	S/N
Laptop	HP	CNF0339QBM

4.4 Countermeasures to achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Constructional Data Form or the Technical Construction File. No additional measures were employed to achieve compliance.

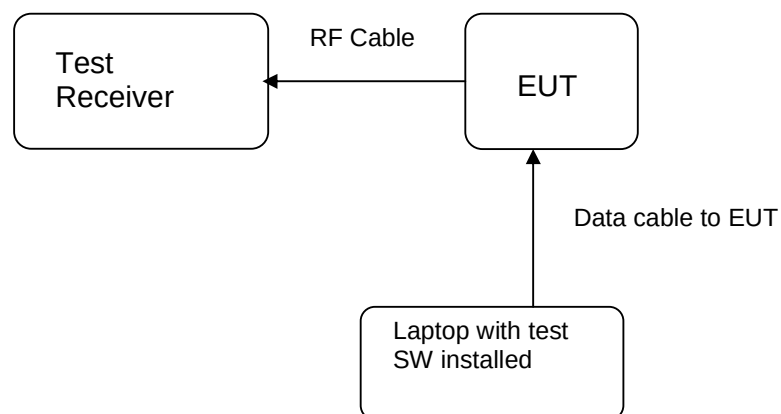
4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test



Note: Measurements above 1 GHz are done with a table height of 1.5m

Diagram of Measurement Equipment Configuration for Conducted Transmitter Measurement



5. Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT:**Passed**

Test standard	:	LP0002(2011): 2.2, 3.10.1, (3) FCC Part 15.247(b)(4), Part 15.203 and RSS- Gen 8.3
Requirement	:	use of approved antennas only with directional gains that do not exceed 6 dBi

According to the manufacturer declaration, the EUT has an antenna with a directional gain of 0 dBi. The antenna is a Chip Antenna soldered to the PCB with no possibility of replacement with a non-approved antenna by the end-user. Therefore, the EUT is considered to comply with this provision.

Refer to EUT photo for details.

5.1.2 Peak Output Power

RESULT:**Passed**

Test standard : LP0002(2011): 3.10.1, (2)
FCC Part 15.247(b)(3), RSS-247 5.4(4)
Basic standard : ANSI C63.10:2013, KDB558074
Limit : 1 Watt
Kind of test site : Shielded room

Test setup

Test Channel : 2402MHz
Operation Mode : A

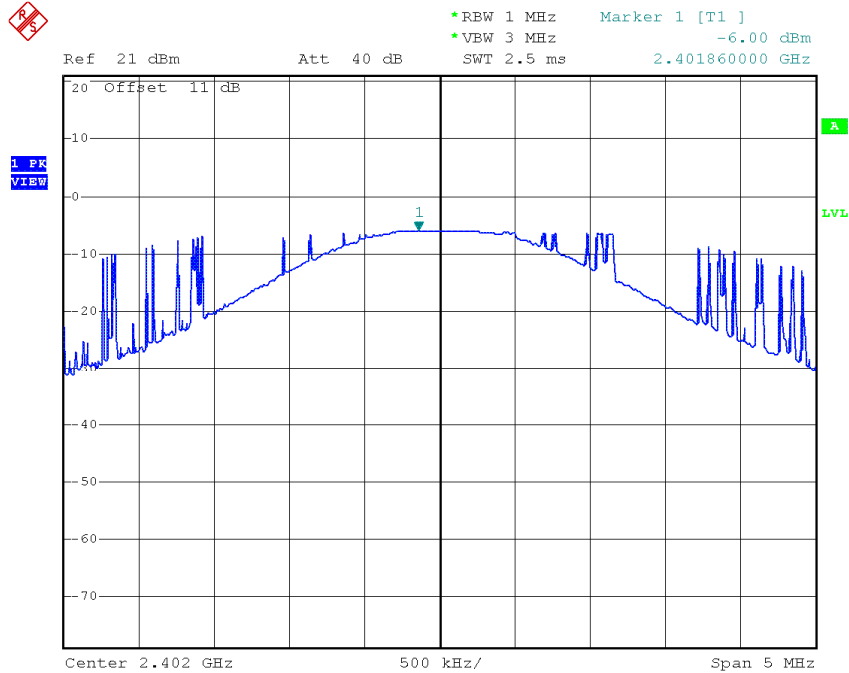
Ambient temperature : 20-24 °C
Relative humidity : 50-65 %
Atmospheric pressure : 100-103 kPa

Table 6: Test result of Peak Output Power

Channel	Channel Frequency (MHz)	Output Power		Limit
		(dBm)	(W)	(W)
One Channel	2402	-6.00	0.0003	1

Test Plot of Output Power

Channel 2402MHz



Date: 14.DEC.2015 12:22:51

5.1.3 6dB Bandwidth

RESULT:
Passed

Test standard : LP0002(2011): 3.10.1, (5)
 FCC Part 15.247(a)(2), RSS-247 5.2(1)
 Basic standard : ANSI C63.10:2013, KDB558074
 Kind of test site : Shielded room

Test setup

Test Channel : 2402MHz
 Operation Mode : A

 Ambient temperature : 20-24°C
 Relative humidity : 50-65%
 Atmospheric pressure : 100-103 kPa

Table 7: Test result of 6dB Bandwidth

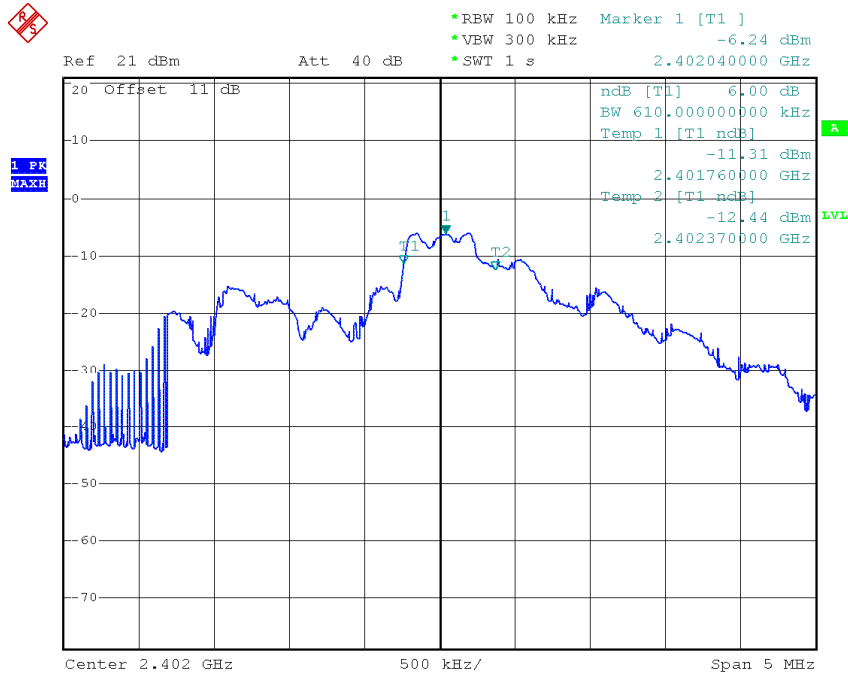
Channel	Channel Frequency (MHz)	6dB Bandwidth (kHz)	Limit (kHz)	Result
One Channel	2402	610	>500	Pass

Table 8: Test result of 99% Bandwidth,

Channel	Channel Frequency (MHz)	99% Bandwidth (MHz)
One Channel	2402	3.08

Test Plot of 6dB Bandwidth

Channel 2402MHz



Date: 14.DEC.2015 12:19:29

Test Plot of 99% Bandwidth

Channel 2402MHz



Date: 14.DEC.2015 12:21:47

5.1.4 Power Density

RESULT:**Passed**

Test standard : LP0002(2011): 3.10.1, (6.2.2)
FCC Part 15.247(e) , RSS-247 5.2(2)
Basic standard : ANSI C63.10:2013, KDB558074
Kind of test site : Shielded room

Test setup

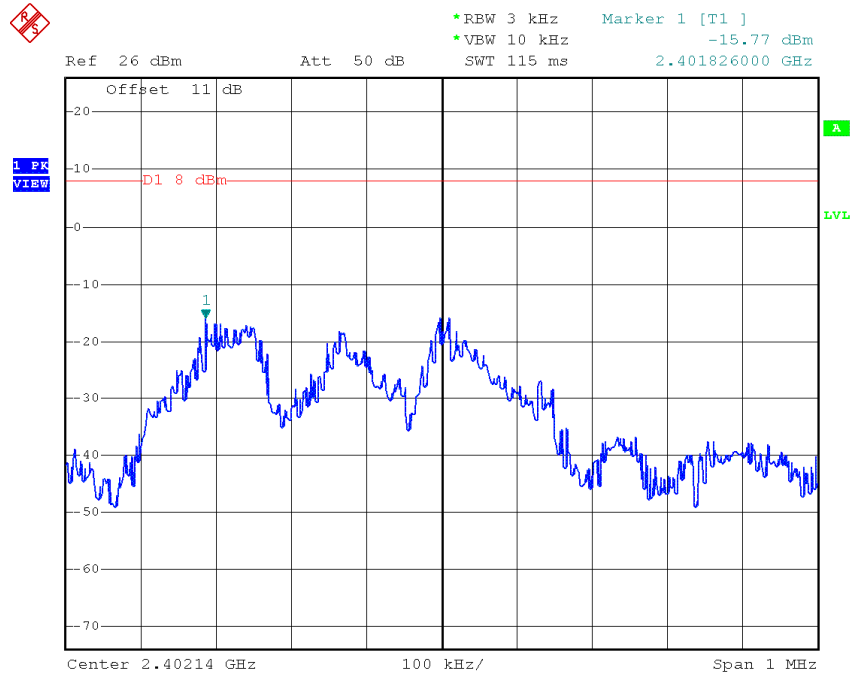
Test Channel : 2402MHz
Operation Mode : A
Ambient temperature : 20-24°C
Relative humidity : 50-65%
Atmospheric pressure : 100-103 kPa

Table 9: Test result of Power Density

Channel	Channel Frequency (MHz)	Power Density	Limit
		(dBm)	(dBm)
One Channel	2402	-15.77	8

Test Plot of Power Density

Channel 2402MHz



Date: 14.DEC.2015 12:10:28

**5.1.5 Conducted spurious emissions and Frequency Band Edge
measured in 100kHz Bandwidth****RESULT:****Passed**

Test standard	:	LP0002(2011): 3.10.1, (5)
	:	FCC part 15.247(d), RSS-247 5.5
Basic standard	:	ANSI C63.10:2013, KDB558074
Limit	:	20dB (below that in the 100kHz bandwidth within the band that contains the highest level of the desired power)
Kind of test site	:	Shielded room

Test setup

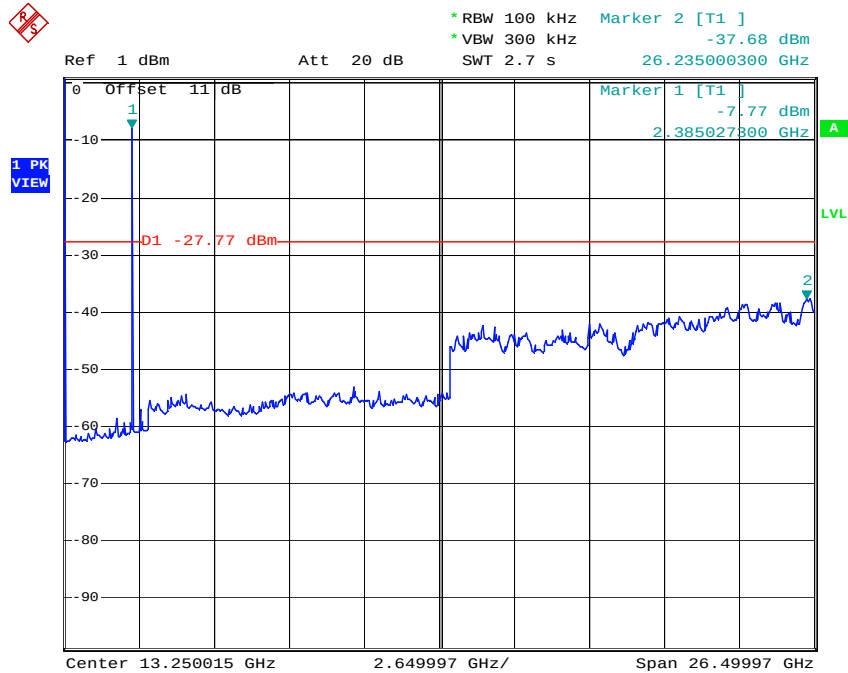
Test Channel	:	2402MHz
Operation mode	:	A
Ambient temperature	:	20-24°C
Relative humidity	:	50-65%
Atmospheric pressure	:	100-103 kPa

All emissions are more than 20dB below fundamental, details refer to following test plot, and compliance is achieved as well.

Due to the small size of the product and that there are no inductive components of significant size, 9kHz to 30MHz frequency range is not tested based on technical judgment.

Test Plot 100kHz Conducted Emissions

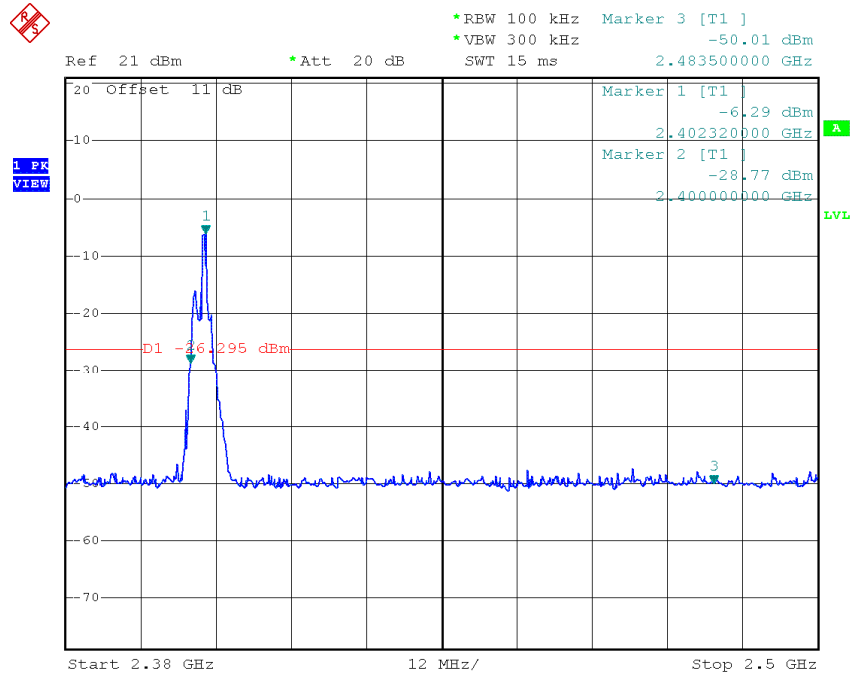
Channel 2402MHz



Date: 14.DEC.2015 12:31:34

Test Plot 100kHz RBW of Band Edge

Channel 2402MHz



Date: 14.DEC.2015 12:54:01

5.1.6 Spurious Emission

RESULT:
Passed

Test standard	:	FCC part 15.247(d), FCC 15.205, FCC 15.209, RSS-210 2.2, RSS-247 5.5 and RSS-Gen 8.9 LP0002(2011): 3.10.1, (5)
Basic standard	:	ANSI C63.10: 2009
Limits	:	Radiated emissions which fall in the restricted bands, as defined in FCC 15.205(a) and RSS-Gen i4, 8.9 (Table 6), must comply with the radiated emission limits specified in FCC 15.209(a) and RSS-Gen i4, 8.9 (Table 4 and 5). Radiated emissions which fall in the restricted bands, as defined in LP0002(2011): 2.7 , must comply with the radiated emission limits specified in LP0002(2011): 2.8 Emission radiated outside the specified frequency bands must comply with the radiated emission limits specified in FCC 15.209(a) and FCC 15.249(a), RSS-Gen i4, 8.9 (Table 4 and 5) and RSS-210 A2.9(a). Emission radiated outside the specified frequency bands must comply with the radiated emission limits specified in LP0002(2011): 2.8
Kind of test site	:	3m Semi-Anechoic Chamber

Test setup

Test Channel	:	2402MHz
Operation mode	:	A, B

Remark: Testing was carried out within frequency range 30MHz to the tenth harmonic.

For details refer to Appendix D.

Testing was carried out within frequency range 30MHz to the tenth harmonic. For details refer to Appendix D. The Radiated Emissions testing was performed in the X, Y and Z axis orientation. The worst-case Axis orientation is recorded in this test report. Due to the small size of the product and that there are no inductive components of significant size, 9kHz to 30MHz frequency range is not tested based on technical judgment.

6. Safety Human exposure

6.1 Radio Frequency Exposure Compliance

6.1.1 Electromagnetic Fields

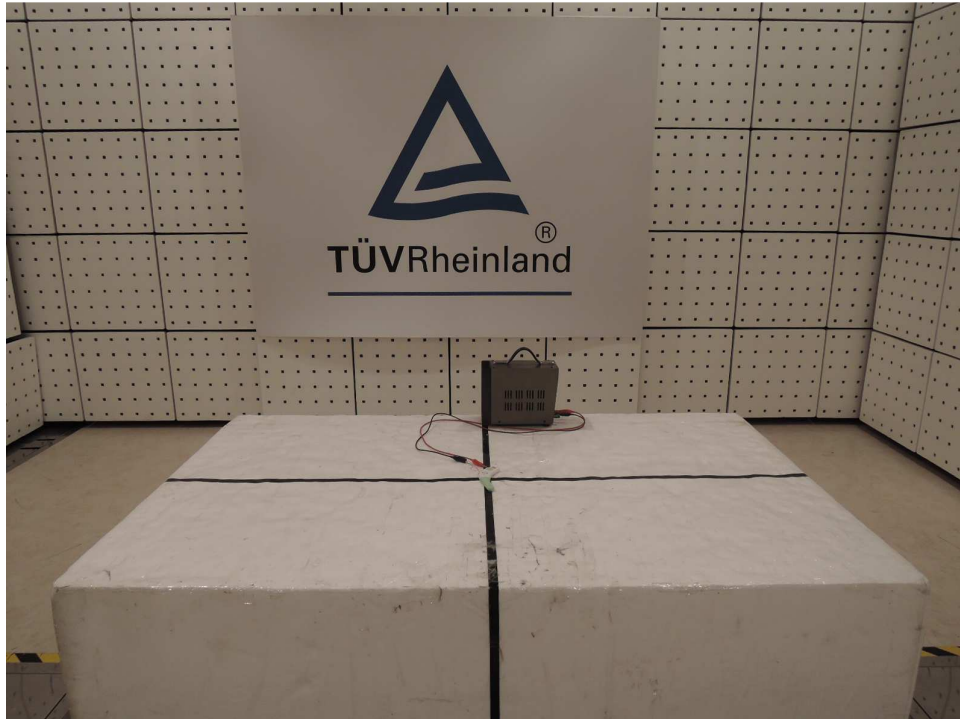
RESULT:**Passed**

Test standard : FCC KDB Publication 447498 D01 v05

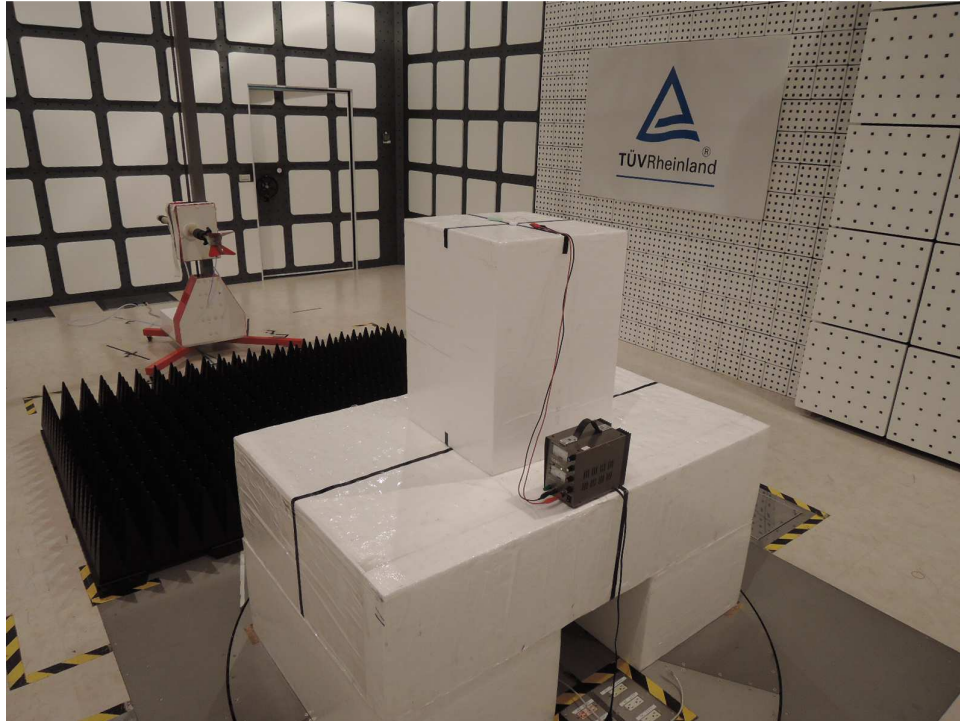
Since maximum peak output power of the transmitter is 0.25 mW < 1mW, hence the EUT is excluded from SAR evaluation according to FCC KDB publication 447498 D01 v05: Mobile Portable RF Exposure.

7. Photographs of the Test Set-Up

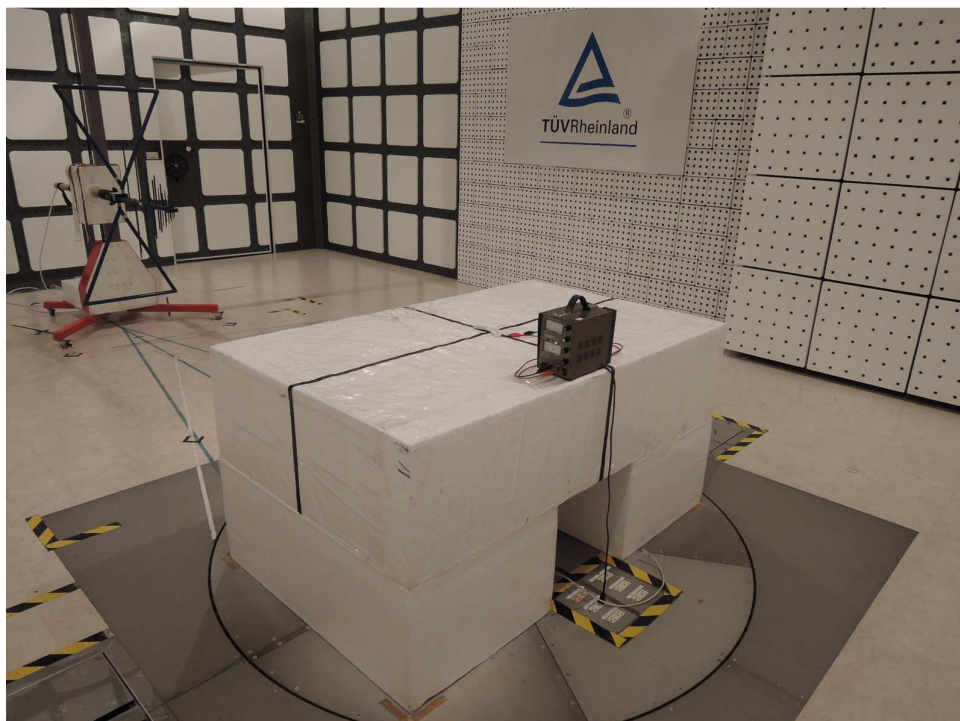
Photograph 1: Set-up for Spurious Emissions (Front View)



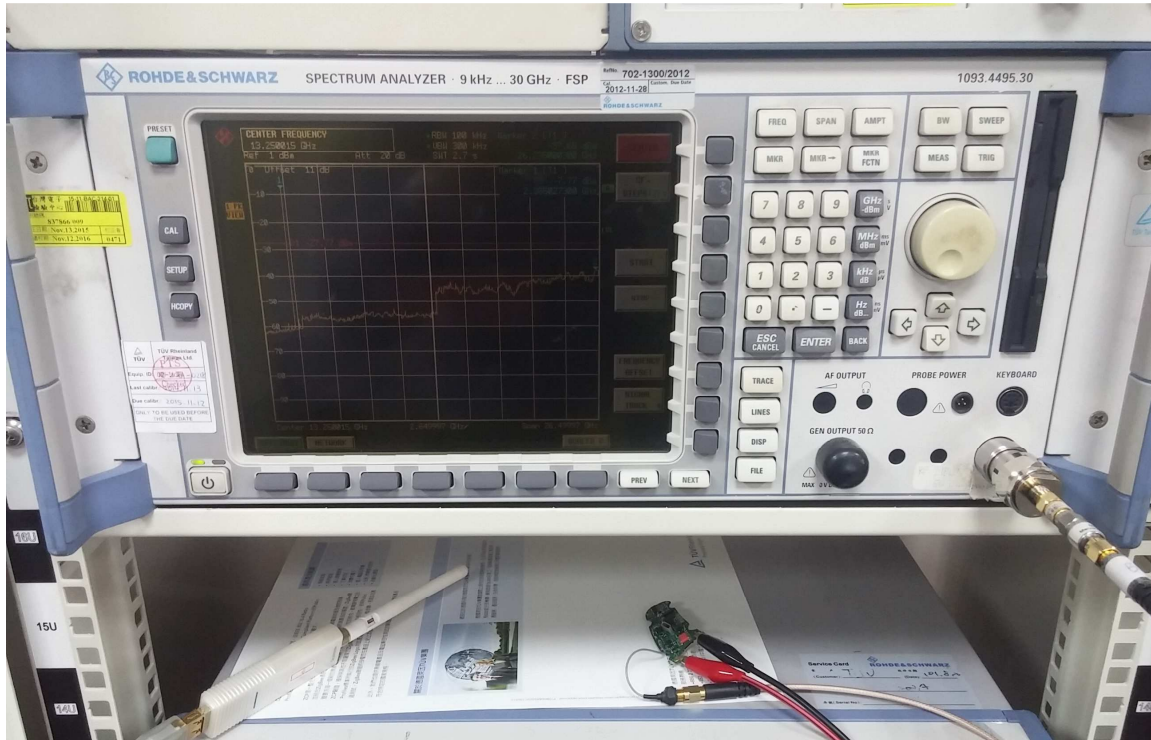
Photograph 2: Set-up for Spurious Emissions (Back View 1)



Photograph 3: Set-up for Spurious Emissions (Back View 2)



Photograph 4: Set-up for Conducted testing



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